

**PERBANDINGAN ALGORITMA (*LINEAR CONGRUENT METHOD, MULTIPLICATIVE RANDOM NUMBER GENERATOR* DAN *FISHER-YATES*) PADA APLIKASI *COMPUTER BASED TEST*: PREDIKSI SOAL UJIAN NASIONAL 2019**

**ABSTRAK**

Kegiatan Ujian Nasional (UN) menjadi agenda yang penting dan strategis dalam dunia pendidikan Indonesia. UN berbasis komputer (*Computer Based Test*) atau yang kemudian disebut dengan UNBK, khususnya pada pelaksanaan UN jenjang SMA/SMK/MA mulai diperkenalkan pada tahun 2015. Pelaksanaan UN dengan menggunakan CBT dilakukan untuk meminimalisir kecurangan yang terjadi saat pelaksanaan UN, salah satu caranya adalah dalam pengacakan soal dan jawaban, yang dimana nomor yang dikeluarkan sama akan tetapi bentuk soal dan jawaban yang berbeda. Dalam implementasi pengacakan soal menggunakan metode *Random Number Generator* (RNG), Pada penelitian sebelumnya beberapa algoritma untuk RNG seperti *Linear Congruent Method*, *Multiplicative Random Number Generator*, dan *Fisher-Yates* dapat menghasilkan nomor secara acak dengan hasil yang kurang memuaskan dari tujuannya, dengan keberhasilan yang bervariasi. Maka perlu perbandingan kinerja antara 3 algoritma RNG dalam segi ketepatan pengacakan soal dan kecepatan waktu eksekusi, sehingga dapat diketahui kelebihan dan kekurangan dari algoritma tersebut. Dari penelitian ini dapat dihasilkan bahwa algoritma *Fisher-Yates* lah yang menghasilkan nilai presentasi terbaik, dengan nilai ketepatan hasil pengacakan soal 100% tanpa pengulangan dan waktu eksekusi tercepat dengan rata-rata waktu 2.72 detik. Kemudian disusul oleh algoritma *Linear Congruent Method* (100%, 6.71 detik) dan posisi terakhir algoritma *Multiplicative RNG* (46%, 14.78 detik).

**Kata Kunci:** *Random Number Generator, Computer Based Test, LCG, Multiplicative RNG, Fisher-Yates.*

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# COMPARATIVE ALGORITHM (LINEAR CONGRUENT METHOD, MULTIPLICATIVE RANDOM NUMBER GENERATOR AND FISHER-YATES) IN COMPUTER BASE TEST APPLICATION: PREDICTION OF 2019 NATIONAL EXAM QUESTION

## ABSTRACT



National exam activities become an important and strategic education agenda in Indonesia, starting from the school level, provincial, to the national level. National examination based computer (Computer Based Test) or later referred to as UNBK, especially in the implementation of SMA / SMK / MA high school level was introduced in 2015. Implementation of the exam by using CBT is done to minimize cheating that occurred during the implementation of the exam, one of the ways is in the randomization of the question, which is where the question number is the same but different question form. In the implementation of question randomization using a Random Number Generator (RNG) method, in previous studies several algorithms for RNG such as Linear Congruent Method, Multiplicative Random Number Generator, and Fisher-Yates can generate numbers randomly with unsatisfactory results from their objectives, with varied success. Then it is necessary to compare the performance of the 3 RNG algorithms in terms of the accuracy of randomization of the questions and the speed of execution time, so that it can know the advantages and disadvantages of the algorithm. From this research it can be produced that the Fisher-Yates algorithm produces the best presentation value, with the accuracy value of 100% randomization without repetition and the fastest execution time with an average time of 2.72 seconds. Then followed by Linear Congruent Method algorithm (100%, 6.71 seconds) and the last position is Multiplicative RNG algorithm (46%, 14.78 seconds).

**Keywords:** Random Number Generator, Computer Based Test, LCG, Multiplicative RNG, Fisher-Yates.

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